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ABSTRACT

This study assessed the influence of class size on the change in student computer attitudes after the completion of a 16-week computer literacy course. The sample consisted of 317 students enrolled in 15 sections of computer literacy courses at a university in the fall of 1993. Class size varied from 16 to 178. The dependent variable was the posttest score on the Computer Attitude Scale (CAS). The pretest score on the CAS was used as a covariate. There was a statistically significant difference between class size and student attitudes on the computer usefulness subscale of the CAS. Students in smaller classes perceived computers to be more useful after completion of a computer literacy course than students in larger classes. Four tables provide survey results. (Contains 13 references.) (Author/AEF)

The Effect of Class Size on Students' Attitudes Toward Computers

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Running head: THE EFFECT OF CLASS SIZE

Abstract

The purpose of this study was to determine if class size influenced the change in student computer attitudes after completion of a 16-week computer literacy course. The sample consisted of 317 students enrolled in 15 sections of computer literacy courses at a major southern university in the Fall of 1993. Class size varied from 16 to 178. The dependent variable was the posttest score on the Computer Attitude Scale (CAS) developed by Loyd and Loyd (1985) to measure student attitudes toward computers. The pretest score on the CAS was used as a covariate. There was a statistically significant difference between class size and student attitudes on the computer usefulness subscale of the CAS. Students in smaller classes perceived computers to be more useful after completion of a computer literacy course than students in larger classes.

The Effect of Class Size on Students' Attitudes Towards Computers

As computer technology enters the classroom, student attitudes toward computers remain a barrier to the learning process (Pope-Davis & Vispoel, 1993). Institutions of higher education have been focusing on computer literacy programs that provide students with the necessary computer skills to enter a highly technical work force. However, due to budget constraints, many colleges and universities are teaching computer literacy courses to students in large class sizes. Gunter (1994) revealed there was a statistically significant change in college students' attitudes toward learning and working with computers after completion of an introductory computer literacy course. The study compared students enrolled in business and education programs.

Research suggests that a relationship exists between student achievement and class size (Ellis, 1984). Glass and Smith (1979) and Smith and Glass (1980) performed meta-analyses that discussed and compared several studies on class size. Their results revealed an inverse correlation between class size and student achievement.

Universities are beginning to reduce the size of large classes to improve undergraduate education (Collison, 1991). White and Lewis

(1992) described an appropriate class size for introductory courses as a major concern of the department heads of 502 four-year colleges and universities. Beyer (1992) accomplished a study that used computers in the classroom to determine if participation would improve writing performance. Variables identified that hindered the project included too few computers for hands-on instruction and large class sizes.

The purpose of this study was to determine if class size influenced the change in student computer attitudes identified by Loyd and Gressard (1984) as computer anxiety, computer confidence, computer liking, and computer usefulness. The instrument used in this study was the Computer Attitude Scale (CAS) developed by Loyd and Loyd (1985) to measure student attitudes toward computers.

Research has concentrated on the relationship between class size and achievement. This study hypothesized that there would be no statistically significant difference due to class size in student attitudes as measured by the Computer Attitude Scale.

Method

The sample for this study consisted of 317 students enrolled in 15 sections of computer literacy courses at a southern university in the Fall of 1993. One hundred and forty-five students were enrolled in College of

Education computer literacy courses and 172 students were enrolled in College of Business and Industry computer literacy courses. Eleven sections of computer literacy courses taught by the College of Education varied in size from 16 to a maximum of 19 students per class. Four sections of computer literacy courses taught by the College of Business had an enrollment of 45, 65, 67, and 178 students.

Four separate analyses of covariance (ANCOVA) procedures were run. Students were administered the CAS as a pretest at the beginning and as a posttest at the end of a 16-week semester. The dependent variables were the four scores on the subscales for the posttest on computer anxiety, computer confidence, computer liking, and computer usefulness. The corresponding subscale on the pretest was used as the covariate to adjust for initial group differences. The independent variable was class size. Classes with fewer than 45 students were considered small and classes with 45 or more students were considered large. The results were considered significant at an alpha level of .05.

Results

A Bartlett-Box test for homogeneity of variance revealed no apparent violations. Exploratory analysis revealed a normally distributed sample. Coefficient alpha reliability estimates for the four subscales, computer

anxiety, computer confidence, computer liking, and computer usefulness varied from .88 to .95. These reliability estimates are similar to previous studies which used the Computer Attitude Scale (Loyd & Loyd, 1985; Grogan, 1991; Pope-Davis & Vispoel, 1993).

There was a statistically significant difference between class size and student attitudes on the computer usefulness subscale, F (14, 301) = 2.139, p = .010 (see Table 1). Scheffe post hoc testing revealed students in smaller classes found computers to be more useful after completion of a computer literacy course than students in larger classes.

Insert Table 1 about here

There was no statistically significant difference between class size and student attitudes on computer anxiety (see Table 2), computer confidence (see Table 3), and computer liking subscales (see Table 4). Students in small classes did not have lower anxiety, higher confidence, or like computers more than students in larger classes after completion of a computer literacy course.

Insert Tables 2 - 4 about here

Discussion

An introductory computer literacy course and class size influenced students' attitudes toward computer technology. Classes with 20 or fewer students gained a better attitude toward the usefulness of computers after the completion of a computer literacy course. Educators must ensure that institutions of higher learning keep up with and teach for the information needs of the future. All students must be prepared with the necessary computer skills to enter the work force. Student attitudes toward technology must be understood by instructors. As revealed in this study, students in a smaller class ($\underline{M}$ = 34.49) found computers to be more useful than students in large classes ($\underline{M}$ = 33.66).

Researchers anticipate that by 2010, all occupations will require knowledge of computer technology (Benjamin & Blunt, 1992). If students perceive that computer technology not to be useful in their lives, they may not realize how important computer technology is to their future employment.

There were a number of limitations in this study. The first limitation was student attitudes about computers were only assessed at two points, the beginning and the end of the semester. The second limitation of this study was that subjects were already enrolled in the specific classes; they were not randomly assigned to individual computer classes. Finally, individual teacher differences and effectiveness and differences in curriculum between the Colleges of Education and Business and Industry were not taken into consideration.

The findings of this study are only applicable to students enrolled at a large southern university in the Fall of 1993. This study should be replicated at other institutions of higher learning to study the impact of class size on students' attitudes about computers.

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Table 1

Analysis of Covariance Summary Table of Computer Usefulness by Class Size

SOURCE	SS	df	MS	F-ratio	p
Covariate	3236.02	1	3236.02	306.21*	.000
Group	316.53	14	22.61	2.14*	.010
Residual	3180.93	301	10.57		

*p < .05.

Table 2

Analysis of Covariance Summary Table of Computer Anxiety by Class Size

SOURCE	SS	df	MS	F-ratio	p
Covariate	6876.17	1	6876.17	420.69*	.000
Group	219.38	14	15.67	.96	.496
Residual	4919.89	301	16.35		

*p < .05.

Table 3

Analysis of Covariance Summary Table of Computer Confidence by Class Size

SOURCE	SS	df	MS	F-ratio	p
Covariate	6346.64	1	6346.64	453.55*	.000
Group	225.81	14	16.13	1.15	.312
Residual	4211.96	301	13.99		

*p < .05.

Table 4

Analysis of Covariance Summary Table of Computer Liking by Class Size

SOURCE	SS	df	MS	F-ratio	p
Covariate	7474.98	1	7474.98	437.92*	.000
Group	179.58	14	12.83	.75	.721
Residual	5137.89	301	17.07		

*p < .05.

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